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Comment Response Document for the Draft Total Maximum Daily Loads of Nitrogen and Phosphorus for Five Tidal Tributaries in the Northern Coastal Bays System Worcester County, Maryland

Introduction

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus loadings to the five major tidal tributaries of the Northern Coastal Bays system: St. Martin River, Bishopville Prong, Shingle Landing Prong, Herring Creek and Turville Creek. The public comment period was open from November 2, 2001 to December 17, 2001. MDE received 12 sets of comments. Comments dated November 28, 2001 were received verbally during the public hearing for these TMDLs. In addition, MDE met frequently with stakeholders during the development of the TMDLs and briefed the Coastal Bays Executive Committee and County Council periodically.

Below is a list of commentors, their affiliation, the date comments were submitted, and the numbered references to the comments submitted. In the pages that follow, comments are summarized and listed with MDE's response.

List of Commentors

Author	Affiliation	Date	Comment Number
Kathleen McHugh	Maryland State Builders Association	November 21, 2001	1
James R. Trader	Salisbury, MD citizen	November 28, 2001	2 through 8
Dennis Escher	Berlin, MD citizen	November 28, 2001	9 through 11
James Stuhltrager	Mid-Atlantic Environmental Law Center on behalf of the Maryland Chapter of the Sierra Club, the American Littoral Society, and the Assateague Coastal Trust	November 28, 2001	12 through 15
Frank Gunion	Friends of Herring and Turville Creek	November 28, 2001	16 and 17
Sandy Coyman	Worcester County Office of Comprehensive Planning	November 28, 2001	18
Carolyn Cummins	Ocean City, MD citizen	November 28, 2001	19 and 20
Karen Holok	Ocean City, MD citizen	November 28, 2001	21 through 23
John E. Bloxom	President, Worcester County Commissioners	December 4, 2001	24 through 34
David P. Blazer	Executive Director, Maryland Coastal Bays Program	December 13, 2001	35 through 42

List of Commentors continued

Author	Affiliation	Date	Comment Number
James Stuhltrager and Taryn B. Kindred	Mid-Atlantic Environmental Law Center on behalf of the Maryland Chapter of the Sierra Club, the American Littoral Society, and the Assateague Coastal Trust	December 17, 2001	Reiterations of 12, 13, and 15; 43 through 47
Gail P. Blazer	Town of Ocean City	December 17, 2001	48 through 50

Comments and Responses

1. Two commentors requested an extension to the public comment period. One commentor sought a 60-day extension, and the other sought a 90-day extension

Response: MDE believes that the 45-day comment period provided for the proposed TMDLs satisfies the U.S. Environmental Protection Agency's (EPA) guidelines for public participation and has afforded the public adequate time in which to make comments. Accordingly, MDE has denied these requests.

In addition to allowing 15 days beyond EPA's suggested 30-day comment period, MDE held a public hearing on November 28, 2001. The hearing was attended by 22 people, seven of whom offered verbal comment. Four people submitted substantive written comments within the comment period provided.

MDE must allocate limited resources to development and submittal of approximately 300 TMDLs around the state over the course of the next seven years, we must adhere to a schedule that provides both the opportunity for comment on completed TMDLs and for work on future TMDLs to commence concurrently. This necessitates closing the formal comment period on December 17, 2001 in order to allow adequate time to review comments received by that date and incorporate any amendments, as appropriate, in the final proposed TMDLs submitted to the EPA on or before December 31, 2001. Although the formal comment period is not being extended, MDE remains open to and welcomes dialogue on this and related matters. In addition, comments can be submitted to EPA during its review process.

2. The commentor stated that the TMDL should consider management of the entire resource, including the impacts of future nutrient management plans developed for the agricultural farmland within watershed.

Response: The purpose of the TMDL analysis is to determine the maximum allowable load from all sources, and to allocate those loads to point and nonpoint sources. Future nutrient management plans developed for the agricultural farmland within the watershed are acknowledged in the report as one of several elements that will be necessary to achieve the loading limits identified by the TMDL analysis; however,

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neither the Clean Water Act nor current EPA regulations direct states to develop a detailed implementation plan as part of the TMDL development and approval process. Although formal implementation planning is currently beyond the scope of the TMDL development process, Maryland is committed to enforcing applicable laws and supporting voluntary initiatives necessary to implement this and other TMDLs. Maryland has several well-developed programs to draw upon as part of future implementation efforts. These include the State Water Quality Improvement Act of 1998, the federal Clean Water Action Plan framework, and the Comprehensive Conservation and Management Plan for Maryland's Coastal Bays.

3. The commentor stated that the TMDL effort should not disassociate sediment and erosion control plans when phosphorus is an issue.

Response: The TMDL establishes the maximum allowable load for nitrogen and phosphorus. The TMDL is not intended to address detailed implementation issues. (See also response to Comment 2.) Sediment and erosion control plans are acknowledged as an important part of ensuring the nonpoint source (NPS) loading limits are addressed. This is particularly relevant to phosphorus, which tends to adhere to sediments.

4. The commentor stated that the draft TMDL document was not available at the Worcester County Library in Snow Hill, Maryland (as advertised in the public notice) when he visited the library on November 23, 2001. The commentor requested that a copy be placed in the library and be made available directly to him.

Response: The draft TMDL document was sent to the Snow Hill branch of the Worcester County Library via UPS overnight delivery. According to the delivery confirmation, the document was received by the library on November 2, 2001 and signed for by "Ennis." MDE contacted the library following receipt of this comment, and learned that the copy sent to the library was lost sometime between November 2, 2001 and November 23, 2001. A copy of the document was provided to the commentor on November 28, 2001. Additionally, a replacement courtesy copy has been mailed to the library to be made available until the end of the public comment period on December 17, 2001. The Department regrets any inconvenience caused by this unforeseen situation.

5. The commentor stated that the impacts of tributyl tin (i.e., an anti-fouling paint applied to crab pots and boat hulls); anti-corrosion agents; and shoreline construction using lumber treated with CCA (copper, chromium, and arsenic) on the water quality of the Northern Coastal Bays should be identified and considered.

Response: Consideration of water quality impairments resulting from use of tributyl tin and CCA-treated lumber is beyond the scope of this TMDL document, which is intended to address nutrient impairments in St. Martin River, Bishopville Prong, Shingle Landing Prong, Herring Creek and Turville Creek.

Toxic substances are typically only present in trace amounts, which are difficult and costly to measure directly. In recognition of this, the State has a fish tissue monitoring program designed to identify toxic substances that have accumulated through the food

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chain. The fish tissue monitoring program is housed in the MDE's Technical and Regulatory Services Administration. Specific questions regarding the fish tissue monitoring program's future plans should be directed to that program. (See also the response to Comment 8).

Based on the experience of MDE's toxicologist, it is not anticipated that tributyl tin from crab pots would pose a problem. The toxicologist also does not anticipate problems from undisturbed boat hulls. Maintenance of boat hulls at marina boat yards could pose a problem if the maintenance is not performed according to best management practices (BMPs). The Maryland Department of Natural Resources (DNR) is actively addressing this potential source in the Isle of Wight watershed via its Clean Marinas Program.

6. The commentor stated that point and nonpoint source discharges upstream from the Northern Coastal Bays should be considered with regard to water quality impacts. Additionally, neighboring states should be coordinated with during the development of TMDLs.

Response: The TMDL analysis considered all upstream loads. With regard to coordination with neighboring states, the draft TMDL document was sent to Delaware Department of Natural Resources and Environmental Control's Division of Water Resources for review and comment. Additionally, the public comment period for the draft document was advertised in the Delaware Coast Press.

7. The commentor stated that discharge permits should be closely scrutinized to determine their impact on new or existing facilities on the Northern Coastal Bays.

Response: Discharge permits will be scrutinized to ensure they are consistent with the nutrient load allocations developed under the TMDLs to protect the Northern Coastal Bays.

8. The commentor stated that other parameters in addition to nutrients should be considered with regard to water quality impairments in the Northern Coastal Bays.

Response: The Clean Water Act directs states to develop TMDLs for each water body for which existing controls are insufficient to achieve water quality standards and for each pollutant or substance that is impairing the waterbody. States are required to assess all their waters and report these findings on a periodic basis to the EPA. Two documents are used to assemble and interpret the data to determine if the designated uses are being met, the 305(b) report (Water Quality Inventory) assembled by DNR and the 303(d) List (List of Impaired Waters) assembled by MDE. Before each report is compiled, requests are made of the public and other organizations and agencies for any data that may be available to determine if waters are meeting their uses.

To date, the Northern Coastal Bays (i.e., Assawoman Bay, St. Martin River, and the Isle of Wight Bay) have been identified on Maryland's 303(d) list as being impaired by nutrients, and fecal coliform bacteria; no other water quality impairments have been listed at this time (See "Note" below). The TMDL document, made available for public comment in November, 2001, only addresses nutrient impairments. (See also

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the response to Comment 15 regarding fecal coliform). If you have, or are aware of, data that demonstrate a problem in the Coastal Bays that is caused by pollutants other than nutrients or fecal coliform, please submit that data to the Department and it will be considered for determining impairment and documenting the need for a TMDL.

Note: Federal regulation requires the 303(d) list to identify the *impairing substance* causing the water quality standards violation. The present listings of Assawoman Bay and Isle of Wight Bay for “dissolved oxygen” are duplicative of nutrients, because the *impairing substances* are nutrients, which lead to the condition of low dissolved oxygen. This listing discrepancy will be resolved when Maryland revises the 303(d) list in 2002.

9. The commentor questioned whether water quality data collected in 1998 was sufficiently representative for development of the nutrient TMDLs for the Northern Coastal Bays.

Response: The 1998 tidal water quality data were sufficient in the St. Martin River and its two tributaries, Shingle Landing Prong and Bishopville Prong. In Herring and Turville Creeks, where data were somewhat limited, phased TMDLs have been proposed. Elsewhere, the data were not sufficient, and TMDLs have not been proposed at this time. Water quality data for non-tidal streams are discussed below in the context of NPS loads.

In the St. Martin River system, the 1998 data collected by MDE included three sampling dates in spring (during the higher flow period) and three sampling dates in summer and fall (during lower flow period). The data were used to calibrate a steady state water quality model for the conditions in 1998 for both lower and higher stream flow regimes. Having model calibrations for the two flow regimes provides a reasonable basis for applying the model to simulate conditions under various flows for which the TMDLs could be estimated.

Similar data were collected and used for calibration purposes in Herring Creek and Turville Creek; however, fewer samples were collected and the water quality model segmentation was coarser than the St. Martin River system. In view of these limitations, the analyses have been proposed in the form of “phased TMDLs.” A phased TMDL is effectively an adaptive management approach, relying more heavily on implementation activities and follow-up evaluation, rather than on the analysis. Planned nutrient control activities will be implemented in concert with a future monitoring schedule to evaluate the implementation activities and future water quality responses.

In Manklin Creek and Greys Creek, TMDLs were not estimated due to a combination of modeling and data limitations. Future data will be collected to verify the impairments in these areas, and if necessary, to support additional TMDL analyses. Data and modeling tools that apply to the open bays are still under review to determine their sufficiency.

Data in non-tidal streams were also collected by MDE in 1998. These data were used primarily to estimate NPS loads associated with the model calibration time periods.

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Although this data provided insights about average annual NPS loads, it was not used to estimate such loads. It should be noted that estimations of current average annual NPS loads are not a required element of the TMDL analysis. The essential aim of the TMDL analysis is to determine the maximum allowable load, regardless of the current NPS load. Although determining the current NPS load from which reductions are needed to achieve the TMDL is an important question, it is distinct and different than determining the TMDL. Thus, the question of sufficiency of data for estimating the current average annual NPS load is beyond the scope of the TMDL analysis. Nevertheless, recognizing the benefit that an estimate of the current NPS loads can bring to important public discourse about future implementation of the TMDL, MDE has provided a baseline estimate of the average annual NPS loads (based on 1997 land use data and average annual loading estimates by land use type). It is acknowledged that this NPS estimate will need to be revised in the future as part of the TMDL implementation process. (See the response to Comment 26 for further discussion regarding NPS loads.)

10. The commentor recalled a statement made during the TMDL presentation that the “TMDL is a goal”. The commentor questioned whether the term “standard” is more appropriate in this context than “goal”, given that the TMDL is a number approved by the EPA.

Response: The term “goal” was not being used in a regulatory manner in the context cited by the commentor. Rather it was being used in the conceptual sense to make a distinction between the loading “target,” or “goal,” that is identified by a TMDL analysis, and the management actions that are necessary to achieve that goal. That is, the TMDL analysis sets the loading goal that guides the implementation process.

Because the commentor suggested the term “standard,” it might also be instructive to take this opportunity to clarify some basic terminology. Technically, the term “standard” refers to water quality designated uses, water quality criteria to meet those designated uses, and an anti-degradation policy. The appropriate term, when referring to numeric or narrative water quality characteristics, is “criterion”.

TMDL analyses deal with two separate quantified targets. The first is the water quality endpoint, or more formally the water quality criterion. This is the threshold value that defines the break point for determining whether or not the waterbody is impaired in regard to a given water quality attribute. In conceptual terms, this is the water quality goal we are trying to reach when restoring an impaired waterbody.

The second quantified target is the TMDL itself. This is the threshold load of a substance or stressor above which the waterbody will fail to meet its water quality criterion. In conceptual terms, this is the loading goal we are trying to reach when restoring an impaired waterbody.

In summary, the TMDL analysis determines the loading goal (TMDL), which is necessary to achieve the water quality goal (criterion). For more information, see attached fact sheets.

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11. The commentor referred to Table 3A in the Technical Memorandum, and questioned whether the table indicates that the contaminant levels of the parameters indicated within the Northern Coastal Bays is currently 30 – 50% above the desired TMDL levels.

Response: Due to the complexities of the subject matter, it is understandable that the commentor might find the referenced summary table difficult to interpret. Table 3A provides a comparison, by sub-basin, of average annual NPS loads of nitrogen allowed under the TMDL, and the estimated baseline load, where the baseline is estimated on the basis of conditions in 1997, the year for which the best land use data is available state-wide. The loads include both terrestrial NPS sources, and direct atmospheric deposition to the water surface. The combined nitrogen reductions of 30% from terrestrial sources and 20% from direct atmospheric deposition are reflected in the TMDL figures. Due to different areas of water surface among the five sub-basins upon which direct atmospheric deposition occurs, computing the percentage reduction between the two columns (Baseline and TMDL) results in a variety of different percentages.

Table 3B addresses phosphorus. Direct atmospheric deposition of phosphorus is included in the NPS load. However, no reduction in phosphorus deposition was assumed in the TMDL computation, because such reductions are not anticipated as part of the Clean Air Act. Thus, the percentage reduction that can be computed between the baseline and the TMDL is due solely to reductions in terrestrial loads. It should be noted that the baseline loads are rough estimates, which implies that the percentage reduction estimates needed to reach the TMDLs are similarly imprecise. (Please see the response to Comment 26 for further discussions of the NPS baseline load estimate.)

12. The commentor stated that referring to the TMDL document as “a planning document” is incorrect, because such phrasing indicates that the TMDL document allows for future growth. The commentor cited 40 CFR 122.4(i), which states no permits shall be issued “to a new source or a new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards.” The commentor stated that no such permits should have been issued since 1996 (i.e., the year in which the Northern Coastal Bays was appeared on the 303(d) list of threatened or impaired waterbodies). (Note: This comment was repeated in written comments dated December 17, 2001 from the same commentor, with the addition of the following statement: “This prohibition must remain in effect until such time as the Coastal Bays meet or exceed water quality standards.”)

Response: The term “planning document” was intended to be used in the conceptual sense that the TMDL sets overall loads, which will affect future planning decisions. (See also the response to Comment 28).

Given that the current loads must be reduced, future development projects will come under significant scrutiny. We disagree, however, that TMDLs represent a blanket exclusion of future development. Future development may occur provided that steps are taken to assure that it is consistent with the TMDL. Ideally, this could take the form of low impact development designs, in combination with reforestation, wetlands enhancement projects, or other load reducing projects to off-set new loads.

Finally, the surface water discharge permitting in this region will be consistent with the TMDL. The local water and sewer plans have precluded new point source discharges for years.

13. The commentor stated that issuing a single NPS load allocation for the five waterbodies addressed in the Northern Coastal Bays TMDL document is inappropriate, given that several types of land uses contributing different NPS loads exist within the watershed. The commentor recommended that a load allocation for each type of land use be calculated. (Note: This comment was repeated in written comments dated December 17, 2001 from the same commentor.)

Response: Maryland has considered the issue raised by the commentor, and discussed it with EPA. Maryland's conclusion is that the TMDL regulations do not require detailed allocations to specific land uses. Common sense dictates that, because incremental changes to land uses occur almost continuously over time, it is not reasonable to make formal allocations to specific land uses in a TMDL.

However, we recognize the benefit to future dialogue on implementation of providing information that gives a sense of viable ways in which the NPS loads could be partitioned among sources in a manner consistent with the overall TMDL. To this end, this information is provided in a supplemental technical memorandum. EPA has indicated that this load partitioning may be done by land uses, or by sub-basins. In the present case, MDE has elected to present this partitioning by sub-basins.

14. The commentor stated that the NPS loads from each land use must be identified in order to determine the effectiveness of any implementation plans (e.g., best management practices) employed to reduce the loads.

Response: See the response to Comment 13.

15. The commentor noted that the Northern Coastal Bays is also listed as impaired by fecal coliform bacteria. The commentor stated that, while the TMDL document at issue was developed to address nutrients, the fecal coliform impairment should also be considered as both the nutrients and fecal coliform bacteria sources contribute to the fluctuations in the dissolved oxygen concentrations. (Note: This comment was repeated in written comments dated December 17, 2001 from the same commentor.)

Response: The Department disagrees that fecal bacteria contribute to fluctuations in dissolved oxygen concentrations. Although some of the investigative work needed to develop fecal coliform TMDLs has been performed as part of the TMDL development for nutrients, the analysis methodologies for addressing nutrients and fecal coliform are substantially different. For this reason, the fecal coliform TMDL analyses could not be performed at this time, given the resources available to the Department. In order to assure progress is being made toward addressing as many water quality standards attainment issues as rapidly as possible, the Department chose to complete the nutrient TMDLs now, rather than waiting until the fecal coliform TMDLs are completed in the future.

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16. The commentor questioned whether the proposed TMDLs for nitrogen and phosphorus loadings in the Northern Coastal Bays will offer a realistic prospect for improvement in the quality of Herring Creek and Turville Creek, given that water quality improvement efforts to-date have been unsuccessful.

Response: Although the challenges are significant, the TMDLs do provide a realistic prospect for making progress on improving water quality. The TMDLs for the five tributaries of the Northern Coastal Bays create a quantified framework for managing nutrient loads. Although some uncertainty remains with regard to nonpoint sources, by setting quantified targets, the TMDLs provide a clear, tangible starting point to guide the next steps in assuring that water quality standards are achieved.

17. The commentor questioned whether the proposed TMDLs will result in a restriction on the approval of permits for new discharges to the Northern Coastal Bays, given that the waters are already “noncompliant”.

Response: When these TMDLs are approved, any proposed new discharge containing nutrients will be closely reviewed to determine whether the discharge could be permitted under the overall load allocations. Under these TMDLs, a new discharge causing an increase in the nutrient load would not be acceptable without an offsetting load reduction elsewhere in the watershed.

18. The commentor expressed concern regarding the uncertain implications of the proposed TMDLs to Worcester County, particularly with regard to TMDL implementation, as well as potential impacts to land use management and discharge permits.

Response: MDE will engage local governments in discussions regarding the issues raised. It is anticipated that existing programs (i.e., Maryland Coastal Bays Program and Watershed Restoration Action Strategies) will be drawn upon to coordinate implementation issues. EPA will also be approached to identify their expectations regarding implementation. In general, it is highly advantageous for local governments to ensure, through ordinance if necessary, that land use management decisions make full use of low impact development techniques. In addition, documenting the preservation or enhancement of the amount of forested land and wetlands is also highly advantageous.

19. The commentor expressed concern that a developer might use the proposed TMDLs to substantiate further development by claiming that their facility or development will not add to the allocated loads.

Response: This is an insightful comment. The NPS loads presented as the baseline by which to compare the TMDL are average values for given land use types, which can vary widely. A more detailed NPS loading analysis would be warranted before drawing conclusions such as those alluded to by the commentor. It is also vital to note that nutrients are not the only water quality concern to consider when making land use decisions. The introduction of impervious surfaces, commonly associated with development, can change watershed hydrology. This can cause sediment erosion

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within the stream network, which degrades the integrity of the stream itself, and increases sediment and associated nutrient loads to down-stream receiving waters.

20. The commentor stated that the proposed TMDLs should consider other impairments in addition to nitrogen and phosphorus.

Response: Please see response to Comment 8 above.

21. The commentor recalled a statement made during the TMDL presentation regarding potential refinements of the model to consider multiple layers, and questioned the impact of the State's budget constraints on future model refinement.

Response: Budget constraints are an issue, although not a serious issue with regard to TMDL development at this time. Available resources will be allocated as necessary to continue the development of defensible TMDLs, and additional resources have been requested from EPA.

22. The commentor questioned at what point MDE will make known that approval of the proposed TMDLs will restrict new point source permits, as per 40 CFR 122.4(i).

Response: The regulation cited by the commentor applies to new and/or expanded discharges of listed substances prior to developing a TMDL. The TMDL development process is open to all interested stakeholders. To this end, the significant dischargers were involved in the TMDL development process, and apprised of the expected outcome of the TMDL study before it was finalized. Additionally, the Assurance of Implementation section of the TMDL document (Section 6.0) states "The implementation of point source nutrient controls will be executed through the use of NPDES permits. The NPDES permits will have compliance provisions, which provide a reasonable assurance of implementation."

23. The commentor questioned whether MDE is in favor of increased enrollments in the Conservation Reserve Enhancement Program addressing NPS pollution from agricultural land, which became effective in Maryland in March 1999. The commentor additionally questioned when NPS reductions based on enrollment in the Conservation Reserve Enhancement Program are incorporated into the TMDLs.

Response: The Department does not have a formal position with regard to supporting the Conservation Reserve Enhancement Program (CREP) from the perspective of broad agricultural public policy relative to other options with similar purposes. However, given the existence of the CREP program, we encourage its use as one of an array of programs that help to reduce nutrient and sediment loads to waters of the State. If information about land areas under CREP was readily available, we would consider using it to improve baseline estimations of NPS loads. However, such types of data are often classified as business sensitive information, and are not made available on a site-specific basis. Note that this would not change the TMDL, but could provide a better estimate of how close or far we are from meeting the NPS loading limits of the TMDL.

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24. The commentor expressed concern that the data used in modeling effort for these TMDLs does not provide a complete picture of the current status and long-term trends of the water quality in the Coastal Bays.

Response: The TMDL document provides sufficient data to verify the impairments for which the TMDLs are developed. The modeling effort used the most recent data to refine the model used for the TMDL analysis. Historic data was considered; however, the technical work group assembled to advise on the TMDL development felt it was of little value to the TMDL analysis. It was not the purpose of this study to compile and present information in a comprehensive manner cited by the commentor. The comment, however, is noteworthy and will be shared with staff at the Department of Natural Resources, and the Maryland Coastal Bays Program in an effort to determine if there is sufficient interest to devote the resources needed to perform an analysis of the kind noted by the commentor.

25. The commentor stated that factors (i.e., groundwater and sediment pollutant loadings) exist, which have significant lag periods before their effect on water quality occurs. Therefore, the commentor requested that impacts of groundwater and sediment pollutant loadings be fully assessed and given appropriate weight in all progress assessments.

Response: The commentor makes an important point for the public record. Nutrient laden groundwater can take many years to reach surface water bodies. Thus, the negative effects of nutrient laden groundwater on surface water quality can persist for many years after sufficient nutrient controls have been implemented. A similar phenomenon can occur with legacy sediments working their way down a stream many years after sediment controls have been affected.

This observation by the commentor is one reason that the initial phases of implementation plans typically emphasize tracking progress on implementing nutrient reduction actions. Associating an estimate of nutrient reduction with each control action, and keeping a tally of the control actions can gauge an overall estimate of progress. These considerations will be factored into the implementation and evaluation process.

26. The commentor expressed concern that “base” or background loadings for NPS – a critical component in designing an implementation strategy – was referred to by MDE staff as the weakest link in TMDL assessment of pollutant sources.

Response: It is essential to understanding the TMDL concept, as it applies in this case, to recognize that the baseline load has no role in determining the maximum allowable load that the waterbody can receive and still meet standards. The TMDL is a number that roughly equals how much of the polluting substance can go into the water. The baseline load estimate is the number that roughly corresponds to how much is currently going into the water. Even if we had no knowledge of the baseline, we could estimate the TMDL. This is to say, the TMDL document could technically be submitted and approved by EPA with no estimate of the baseline. However, because we recognize the value of placing the TMDL into context, and of beginning the dialogue on implementation, MDE has provided an estimate of the baseline load. If the baseline

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loading estimate is too high, then the percent reduction needed to reach the TMDL is lower than what has been reported. The reverse is true if the baseline loading estimate is too low.

27. The commentor requested notification of and access to all independent and governmental assessments of the modeling techniques used to develop the TMDLs. Additionally requested was the ability to submit comments and participate in future review and refinements of modeling procedures.

Response: A good faith effort will be made to assure notification; however, the Department cannot guarantee notification in perpetuity. The Department can provide TMDL materials that are releasable under the Maryland Public Information Act (§10-611 to §10-628 of the State Government Articles).

28. The commentor questioned to what extent the TMDLs will become a regulatory instrument.

Response: TMDLs do not develop new regulations, but rather provide a tool to guide the implementation of existing laws and regulations. Through the National Pollutant Discharge Elimination System (NPDES) permit process, point sources will be allocated part of the TMDL through enforceable water quality-based discharge limits. Nonpoint sources will be expected to implement their loading allocation through voluntary incentive programs for best management practices or other existing statutes or programs. TMDLs will also generate data and information that can be used to assist locally led watershed protection efforts. TMDLs also will inform lawmakers and regulators in considering the need for additional regulatory or nonregulatory programs for point or nonpoint source pollution.

29. The commentor questioned what role Worcester County will be required to play in TMDL enforcement.

Response: Maryland is committed to enforcing applicable laws and supporting voluntary initiatives necessary to implement this and other TMDLs, and anticipates that Worcester County is equally committed to this effort.

30. The commentor questioned what impact the TMDLs will have on development amount, intensity, location, and timing of Worcester County's implementation of the Comprehensive Conservation and Management Plan for Maryland's Coastal Bays (CCMP).

Response: The question involves detailed implementation issues, which are beyond the scope of the TMDL analysis. (Please see the responses to Comments 2, 12, and 18.) The TMDL document cites the CCMP in support of reasonable assurance of implementation.

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31. The commentor questioned whether litigation associated with the implementation of TMDLs should be expected.

Response: As of December 2001, the Department has no knowledge of litigation planned, or being considered, in regard to these TMDLs. The Maryland Administrative Procedures Act does not afford a right to judicial review of a TMDL until it is used as the basis for developing permit limits or certain other regulatory controls. However, it is impossible to speculate as to the likelihood that such implementation measures will be challenged through litigation.

32. The commentor questioned whether sufficient flexibility exists to amend the TMDLs as new information becomes available.

Response: The federal TMDL program is sufficiently flexible to allow for revisions if warranted by new information or new analytical tools.

33. The commentor questioned whether sufficient information and/or research exist regarding corrective techniques (e.g., BMPs) for nonpoint sources to develop an effective strategy to address such sources. The commentor additionally questioned whether sufficient management techniques exist to meet the proposed TMDL standards, given the significant influence of atmospheric deposition and groundwater contribution to pollutant loads (and the limited influence of humans over such contributions to water quality).

Response: Sufficient information is available to develop reasonably effective nonpoint source management action strategies. Where greater uncertainty exists, an adaptive management approach may be taken. This involves implementing incremental, common sense management measures in an iterative manner and evaluating their effectiveness each iteration. (See also the response to Comment 25).

34. The commentor questioned whether additional measures exist to realize significant nutrient loading reductions to meet the TMDLs, given that point sources in the watershed are limited and already using best available nutrient reduction technologies, the agricultural community within the watershed has one of the highest BMP implementation rates, and recent improvements to sediment and erosion control and stormwater management regulation have all been implemented.

Response: The commentor raises worthwhile issues to pursue during future discussions regarding implementation. The purpose of a TMDL analysis is to determine the maximum loading limit that meets current water quality standards. It is a goal-setting analysis. Moreover, although the analysis considers possible implementation scenarios in order to provide assurance that the TMDL can be achieved, the TMDL does not determine 'how' to reach that goal. (See also the response to Comment 2.)

35. The commentor questioned how the TMDLs will be used in a regulatory or permit application process for additional point or nonpoint sources. The commentor also questioned how the regulatory framework will be used to prevent additional loads if these watersheds are still in excess for nitrogen and phosphorus. The commentor

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suggested that more clarity is needed on how the regulatory framework will be used in the decision-making process, as well as whether this is only voluntary at this time.

Response: The TMDLs will guide MDE's future regulatory decisions. An on-going national dialogue is underway on this general subject, and thus the policy is currently evolving. The TMDL limits are not voluntary. However, defining "progress on meeting the nonpoint source allocations" is difficult to do (See the response to Comment 25 regarding ground water lag time, etc.). It is the State's desire to work jointly with all stakeholders to develop an agreeable framework for tracking progress on meeting the NPS loading goals.

36. The commentor stated that more guidance is needed regarding where reductions should be targeted. The commentor also requested a clarification regarding the criteria used as a baseline, and what can be told about the contribution of the different sources to enable the area to prioritize where the most significant and cost-effective reductions can be achieved.

Response: Although these issues are of interest to the State, they are beyond the scope of the TMDL analysis, and should be addressed in future dialogue concerning implementation. See the response to Comment 2 for further discussion on the scope of the TMDL as it relates to detailed implementation planning.

37. The commentor stated that additional information and guidance are needed to calculate current and future loads, and to determine how changes in land use will affect the TMDL. The commentor also questioned how the TMDLs will be used in future decisions regarding new proposed point sources, changes in land use and development, quantification and credits of BMPs, credits for new and improved BMPs, and nutrient trading.

Response: See the responses to Comments 35 and 36.

38. The commentor stated that additional work is needed to test the model to assure that it is reliable and accurate of the conditions and predictability of changes of the bays. The commentor also suggested that additional information regarding the appropriateness of the one or multi-layered model is needed for the bays and tributaries.

Response: The TMDL analyses were conducted using the best readily available data and analysis tool. We anticipate continued coordination and dialogue on future monitoring and analysis approaches. In particular, we look forward to continued progress on assessing outstanding questions noted by the commentor in regard to the open bays. (See also the response to Comment 32).

39. The commentor suggested that the data collection and monitoring schedule be improved so the information being used is sufficient for the models and will become a good predictor of water quality changes. The commentor also noted that, while the process used the best available information, there is a clear indication that more monitoring and better data is warranted.

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Response: We concur with the commentor's assessment. We envision participating in future monitoring efforts involving multiple State agencies, local governments, and the Maryland Coastal Bays Program. It is our hope that the Maryland Coastal Bays Program can play a leadership role in bringing all interested parties together in this endeavor. Maryland will also consider this comment in future efforts to refine the State's Water Quality Management Strategy. This will be done in coordination with EPA's "Program Integration" initiative, which seeks to promote more efficient use of limited resources to improve the basis of regulatory decision-making.

40. The commentor noted that there is a need to improve monitoring, data and the model before we continue to develop TMDLs in the other coastal bays watersheds. The commentor also noted that it is important that the TMDLs for the remaining part of the northern bays will follow in coming years and include the Assawoman and Isle of Wight Bays, as well as Manklin and Greys Creeks.

Response: In general, we concur with the comment. The response to Comment 9 provides further discussion of the current status of data for the separate waterbodies within the Isle of Wight and Assawoman Bay watersheds. Water quality monitoring in this region is scheduled by MDE in 2003. Next year, 2002, represents the end of the cycle for MDE's Five-Year Watershed Cycling Strategy for monitoring. The monitoring cycle began on the Lower Delmarva Peninsula in 1998, thus monitoring in 2003 on the Lower Delmarva Peninsula represents the first repeated monitoring of a basin under MDE's Watershed Cycling Strategy. We encourage others to coordinate their monitoring efforts with MDE's Technical and Regulatory Services Administration during the next year to enhance the utility of the available monitoring resources for future purposes. (See also the response to Comment 39 regarding coordination of monitoring efforts).

41. The commentor questioned how biological or living resource indicator or references were used. The commentor also questioned what the parameters of water quality conditions were used to determine the adequacy for living resources.

Response: Biological indicators were not used directly in this TMDL analysis, other than as general background for the analysts conducting the TMDL study. Maryland has recently adopted a systematic data interpretation protocol that allows water quality standards determinations to be made on the basis of statistics collected on fish and benthic organisms (the Maryland Biological Stream Survey, Maryland DNR). At present, this protocol does not apply to tidal waters, which were the focus of the Northern Coastal Bays TMDLs. The development of biological indicators for tidal waters is an area of active research and development. In response to the question of what water quality indicators were used, the TMDL analyses considered the concentrations of dissolved oxygen, and chlorophyll *a*, an indicator of algal growth.

42. The commentor suggested that the designation "phased TMDL" be clarified. The commentor also questioned what exactly this designation means in terms of legal and scientific issues. The commentor further questioned how a phased TMDL differs and/or compares to a regular TMDL.

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Response: A phased TMDL has all the elements and standing of a traditional TMDL, including allocations calculated with margins of safety to meet water quality standards. A phased TMDL explicitly adopts an iterative approach that places less emphasis on the initial analytical study, and more emphasis on common sense actions to fix the water quality problem. The phased approach makes use of the concept of adaptive management in which incremental steps are taken, and feedback information is collected and assessed over time to ensure progress is being made. A phased TMDL meets EPA's requirements provided, it is accompanied by implementation planning information, a schedule of future monitoring to evaluate progress, and an estimate of when water quality standards are expected to be achieved (2013 in the case of Herring Creek and Turville Creek). See the response to Comment 9 for further discussion. Also, see Section 5.0 and Section 6.0 of the TMDL document.

Phased TMDLs are supported by a national consensus on ensuring progress is made toward attaining water quality standards by developing and implementing TMDLs. This consensus was reflected in one of five "key principles" voiced by the Federal Advisory Committee (FACA) on the TMDL Program in its July 1998 report to the EPA. In that report, the FACA stated that "In cases of uncertainty, an iterative approach to TMDL development and implementation will assure progress toward water quality standards attainment."

This consensus was reinforced by the 2001 study of the TMDL Program by the National Academy of Sciences (NAS), which was mandated by the U.S. Congress. The NAS indicated that, "Adaptive implementation is needed to ensure that the TMDL program is not halted because of lack of data and information, but rather progresses while better data are collected and analyzed with the intent of improving upon initial TMDL plans."

43. The commentors stated that, although the time scheme for model calibration appears to omit the winter months between October through March, the TMDL refers to "data collected during the high flow period (February and March)." The commentor stated that seasonal variations must be considered in the TMDL development process in accordance with 33 U.S.C. § 303(d)(1)(c). Additionally, the commentors requested that the TMDL clarify what constitutes the "high flow" time frame, and present water quality information to support TMDL development for this "high flow" period.

Response: The TMDL analyses for St. Martin River, Shingle Landing Prong, and Bishopville Prong were conducted for low flow and average annual flow conditions to explicitly address seasonal variations. The TMDLs for Herring Creek and Turville Creek were computed solely for the higher average annual flow conditions. The analysis for these later two cases implicitly addresses seasonal variations in the following ways. First, the NPS controls necessary to meet the higher average flow conditions will also result in nutrient load reductions during the low flow period. These NPS reductions are similar to what was necessary in the St. Martin River system. Second, there are no point sources in these later two water bodies. As a consequence, the NPS reductions alone are expected to meet the needs during the low flow condition.

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The term “high flow” was used often within the report in reference to the period of late winter to early spring in 1998 when stream flows are high relative to other seasons. We recognize the potential confusion with the literal use of the term “high flow” in regard to long-term statistical descriptions of stream flow, and will consider ways to address this in future TMDL documents, such as using the phrase “winter/spring flow.”

44. The commentors stated that the proposed TMDL does not explicitly explain the implementation process of this TMDL. Additionally, the commentors recommended that a more detailed and thorough explanation regarding how the strategies mentioned in the document will allow the Coastal Bays to meet water quality standards.

Response: Please see the response to Comment 2 for further discussion on the scope of the TMDL as it relates to detailed implementation planning. It should be noted, however, that the phased TMDLs for Herring Creek and Turville Creek do provide more detailed implementation planning information, in addition to a schedule for monitoring (See Section 6.2 of the TMDL document, and also the response to Comment 42 for further discussion of the phased TMDL approach).

45. The commentors suggested that MDE provide greater detail on the methods and procedures used by the State to monitor these tributaries. Additionally, the commentors suggested that an evaluation of implementation begin prior to the five year planned date to assure water quality standards are met and the implemented programs are successful.

Response: The responses to Comments 9, 39, and 40 provide discussion about monitoring data, future monitoring coordination, and scheduled monitoring by the Maryland Department of the Environment (MDE). MDE will consider conducting monitoring out-of-cycle in the Northern Coastal Bay region; however, any monitoring done by MDE would probably be limited due to prior commitments in the Potomac River Basin in 2002. This emphasizes the need for a coordinated monitoring strategy.

46. The commentors expressed concern that the proposed TMDL does not discuss any future implementation at point sources (e.g., the Ocean Pines Wastewater Treatment Plant and Perdue Farms Inc. in Showell), nor does it discuss evaluation of the waste load allocations or possible decreases in future permits.

Response: The TMDL report, Appendix, and Technical Memorandum provide extensive discussion on these matters. To summarize, the Perdue plant upgrade in Showell was completed in 1998. The Ocean Pines plant is using advanced nutrient removal technology allowing it to discharge nitrogen at or below 3 mg/l (this compares with 8 mg/l goals in Maryland’s 1995 Nutrient Reduction Tributary Strategies under the Chesapeake Bay Agreement). These treatment actions, which are consistent with the TMDL analysis, are being implemented under NPDES permits.

47. The commentors recommended that the proposed TMDL be designed to realistically consider the effect of population growth on the achievement of water quality standards.

Response: The TMDL determines the allowable load that may go into the water bodies of interest. Provided that steps are taken to control the future loads, there is no

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theoretical limit on the population, thus no way to incorporate that into the analysis. An extreme example will clarify this point. If future increasing populations are willing to bear the cost of creating systems that capture their nutrient load, and transport that load out of the watershed without impairing another waterbody, then from the perspective of the nutrient TMDL, they may do so without limit on the population.

48. The commentor noted that two of the five waterbodies have not been shown to have dissolved oxygen levels below the selected 5 mg/l minimum criterion; instead, the need for a TMDL has been justified based on the assumption that dissolved oxygen levels are likely to dip below the criterion during early morning hours because of the observed high chlorophyll *a* levels. The commentor expressed concern that the listing would not meet EPA's guidance on listing.

Response: Maryland did not mean to imply that the sole reason for controlling high chlorophyll *a* concentrations was to prevent low dissolved oxygen due to diurnal fluctuations. During EPA's review of the TMDL, they will have the opportunity to address this concern. If they agree with the commentor, EPA may recommend removal of the waterbody from Maryland's 303d List.

49. The commentor recommended that the State go through the process for developing a water quality standard for chlorophyll *a* incorporating magnitude, frequency, and duration tied to specific uses before it is used in the TMDL process.

Response: Threshold values of chlorophyll *a* have been used for over a decade under authority of the State's narrative criteria, to evaluate eutrophic conditions and set water quality endpoints consistent with the designated uses of a waterbody. This has allowed the State to make water quality management decisions that support the mandatory water quality standards and are consistent among the regulated community. Through common usage and public review, literature and other published material, and site-specific data, Maryland has found that 50 µg/l is generally achievable and provides adequate protection of a waterbody's designated uses.

50. The commentor noted that a recent congressionally mandated review of EPA's TMDL program by the National Academy of Sciences found that states should develop appropriate use designations for waterbodies in advance of assessment, and refine these use designations prior to development of a TMDL. The commentor stated that Ocean City would be happy to assist the State in the appropriate use review processes for the open bays.

Response: Designated uses have been established for the Northern Coastal Bays; however, MDE does not have information presently to support a change. We appreciate the commentor's willingness to participate in any future process associated with enhancing the use designation of waters in the Northern Coastal Bays Region. Use Attainability Analyses (UAA) are required in order to justify changes to designated uses. UAAs allow for subjective societal preferences to be introduced into the water quality management framework. As such, they are very time-consuming, because they demand rigorous study and public involvement.

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The National Research Council's (NRC) finding on UAAs is difficult to interpret from a practical standpoint, particularly in view of other recommendations they made. If TMDL development were to wait for UAAs to be conducted, it would effectively halt TMDL development. This seems to conflict with the NRC's recommendation to employ adaptive management approaches, also voiced in a consensus recommendation of the 1998 Federal Advisory Committee on TMDLs. The NRC report states "Adaptive implementation is needed to ensure that the TMDL program is not halted because of lack of data and information, but rather progresses while better data are collected and analyzed with the intent of improving upon initial TMDL plans." Given these logical conflicts, it is likely that Maryland will continue to develop TMDLs in parallel with consideration of enhancements to designated uses.